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(12) UK Patent Application (19) GB (11) 2 108 207 A

(21) Application No 8227953

(22) Date of filing  
30 Sep 1982

(30) Priority data

(31) 307462

(32) 1 Oct 1981

(33) United States of America  
(US)

(43) Application published  
11 May 1983

(51) INT CL<sup>3</sup> B65D 83/00

(52) Domestic classification  
F1R 15B1  
U1S 1124 1125 1456  
F1R

(56) Documents cited

GB 0243002

GB 240875

GB 0232235

(58) Field of search  
F1R

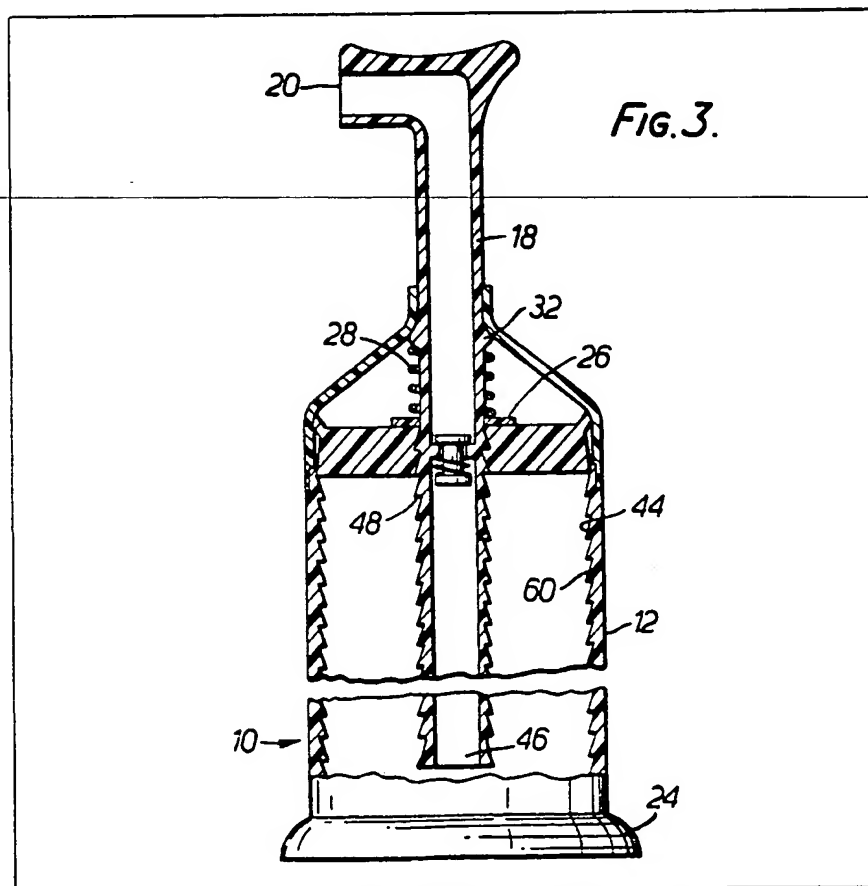
(71) Applicant  
Colgate-Palmolive  
Company  
(USA-Delaware)  
300 Park Avenue  
New York  
New York 10022  
United States of  
America

(72) Inventor  
Stephen Tamis Connors  
Kenneth Harvey

(74) Agent and/or Address for  
Service  
Kilburn and Strode  
30 John Street  
London WC1N 2DD

(54) Dispenser for pressurized products

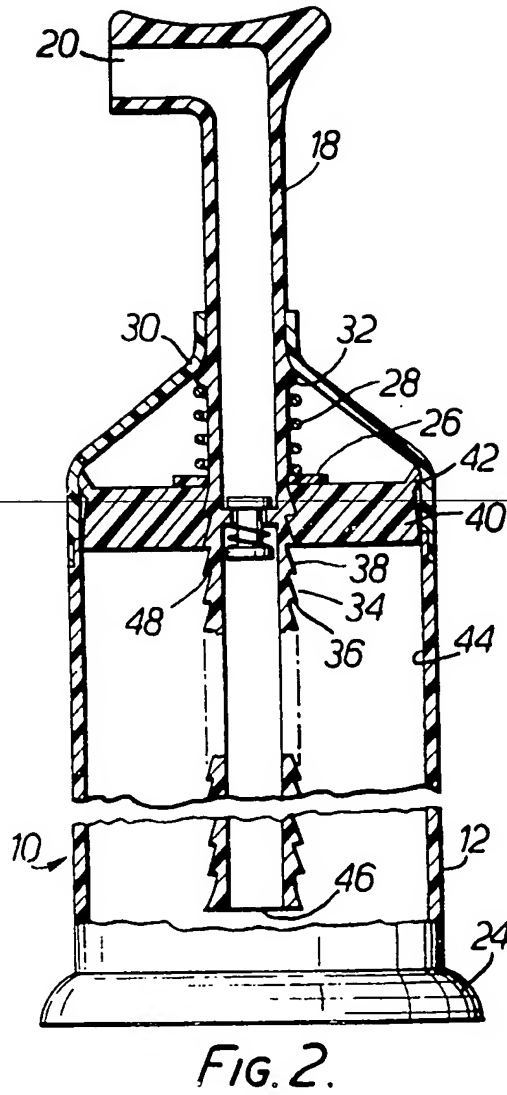
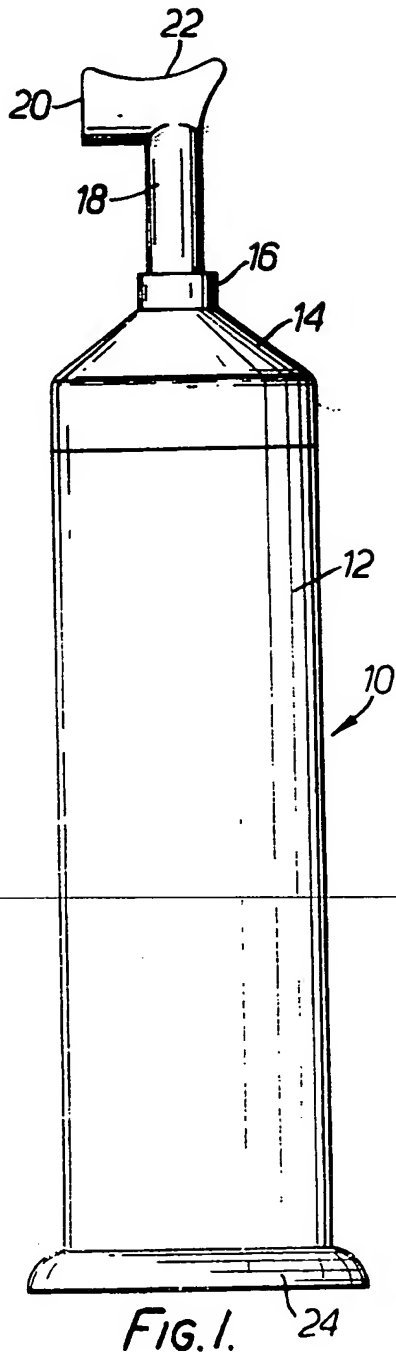
(57) A toothpaste dispenser comprising a container having a neck through which a plunger tube 32 extends. A semi-flexible piston 40 is disposed in the container for movement downwardly only. A ratchet 34 is provided on the outside wall of the plunger which extends through the piston for moving the piston to additionally pressurize the container and extrude product through the tube. A spring 28 returns the plunger to its initial position after a downwards movement, and there is provided a one-way valve 48 in the tube which only opens when the container is additionally pressurized.



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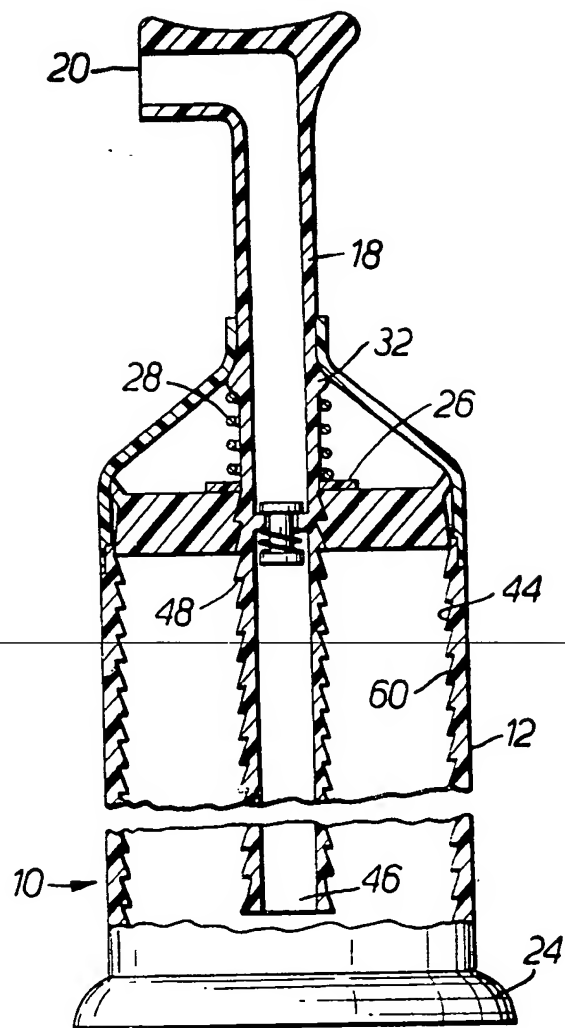


FIG. 3.

## SPECIFICATION

### Dispenser for pressurized products

5 The present invention relates to a free standing dispenser for pressurized products such as toothpaste, shaving cream and the like.

Self-standing dispensers for toothpaste and the like are disclosed in German Patent Publications 1,210,149 and 2,611,644.

In the past pressurized products have been dispensed from aerosol containers. In these types of containers a propellant under high pressure is used to dispense the product.

15 Such a device is shown in United States Patent No. 3,992,003.

A valve assembly for dispensers is shown in U.S. Patent No. 3,097,766 which requires prefilled propellant.

20 United States Patent No. 2,356,874 to Nageotte discloses a container provided with a ratchetting piston and having a slide valve. However, Nageotte does not contemplate having an existing pressure in the container and a valve opening only after application of additional pressure.

In Spatz, U.S.P. 3,255,935 fingers on a piston engage a vertical actuating rod as well as the inside wall of a container to permit one-way movement of the piston.

In both Craven U.S.P. 993,579 and Sohn, U.S.P. 2,732,101 a piston is used to force the contents through a central column.

The prior art does not contemplate low pressurized products being packed in a pump-type dispenser.

The present invention aims to provide a free-standing pump type dispenser in which low pressurized products are packaged and dispensed.

40 The present invention relates to a free-standing pump type dispenser for toiletry products such as shaving cream, toothpaste, and the like which is packaged in the container under low pressure. The products is expelled under additional pressure by the operation of a toothed plunger cooperating with a semi-flexible plate serving as a piston to decrease the volume of the container and thus increase the pressure on the already pressurized products. A valve is mounted in the plunger to release product through the hollow centre of the plunger with the valve closing at the pre-set initial pressure.

55 The invention may be put into practice in various ways and two specific embodiments will be described by way of example to illustrate the invention with reference to the accompanying drawings in which:

60 *Figure 1* is an elevational view of a first embodiment of a free-standing pump type dispenser according to the invention;

*Figure 2* is a vertical sectional view of the dispenser shown in Fig. 1; and

65 *Figure 3* is a vertical sectional view of a

second embodiment of the invention.

In the accompanying drawings like reference numerals designate similar parts in the various views. Reference numeral 10 is used 70 to generally designate a free-standing pump type dispenser according to the present invention. The dispenser 10 has a preferably cylindrical container 12 having a truncated portion 14 terminating in a neck 16 in which a 75 plunger 18 is closely slidably mounted. The plunger includes an outlet spout 20 and is contoured at the top to provide a convenient finger grip 22 for facilitating depression of the plunger 18. The container 12 is preferably 80 provided with an enlarged footed bottom 24 which provides for more stable free standing qualities.

Fixedly mounted on the plunger within the container is a collar 26. A coil spring 28 85 under initial tension is anchored to the collar 26 and to the upper part of the truncated portion 14 at 30 to continuously resiliently urge and pull the plunger to a raised position after it has been depressed. A stop 32 (in the 90 form of a bulbous projection encircling the plunger 18) force fitted through the neck 16 is used to limit the upward movement of the plunger while maintaining the plunger 18 in a stable condition. Below the collar 26 the 95 plunger 18 is serrated forming ratchetting teeth 34 having downwardly and outwardly extending side surfaces 38 and terminating in shoulders 36. Mounted about the serrated portion of the plunger 18 is a semi-flexible 100 plate 40 functioning as a piston and preferably formed of a rubber-like material and having a flexible upper lip 42 arranged to engage the inner wall surface 44 of the container 12.

Thus on depression of the plunger the 105 shoulders 36 of the teeth 34 engage the rubber-like material of the plate 40 (which in the resting condition fits closely around them) but on the upward return movement of the plunger (caused by the return spring 28) the 110 teeth can slide back through the plunger without substantially withdrawing it back up the container.

The plunger is hollow and has its lower end provided with an inlet opening 46 which is 115 closely spaced from the bottom of the container after the plunger has been depressed. Within the hollow plunger is a one-way valve 48 which opens only after the pressure on the product exceeds the pressure under which the 120 product was originally packaged in the container 12.

In operation, depression of the plunger 18 causes a shoulder 36 to engage the plate 40 to force the plate 40 downwardly further 125 compressing the product. Of course, the first movement of the plunger downward will cause the collar 26 to engage the plate 40 to first depress the plate 40 until the successive shoulders 36 can engage the plate 40. The 130 lip 42 is tensioned against the side wall 44 of

the container 12 and permits downward movement of the plate 40 whilst also providing a seal against escape of product and strongly resists upward movement of the plate 40. Depression of the plunger 18 causes downward movement of the plate 40 further pressurizing the product and forcing it up through the inlet opening 46. The increased pressure causes the valve 48 to open permitting the product to flow out of the spout 20 until the preset pressure on the valve is reached which corresponds to the initial packaging pressure at which point the valve 48 closes again. The tension spring 28 will then pull the plunger upwardly until limited by the stop 32. However the lip 42 will retain the plate 40 in its lowered position until the next actions of the shoulders 36 upon depression of the plunger will successively move the plate downwardly until it substantially reaches the bottom 24 of the container 12 at which time substantially all of the product will have been dispensed.

In Fig. 3 there is shown a modified form of the invention which is substantially similar and acts in the same manner as the form of the invention previously described. In this embodiment of the invention serrations 60 complementary to the serrations on the plunger 18 are provided on the inside wall 44 of the container 12. These serrations are in the same direction as the serrations on the plunger 18 and provide for greater stability for the plate 40 ensuring that as the plunger 18 returns upward through the plate 40, the plate 40 remains in its new lowered position.

#### CLAIMS

1. A dispenser for pressurized products comprising a container adapted, in use, to contain a pressurized product therein under a preset pressure, hollow plunger means extending into the said container, piston means on the said plunger for increasing pressure on the said product upon downward movement of the said plunger, and valve means in the said plunger arranged to open, in use, at said increasing pressure to permit outward flow of the product and arranged to close when the said preset pressure is reached.

2. A dispenser comprising a container having a neck, the said container adapted, in use, to contain a pressurized product therein at a preset pressure, a hollow plunger slidably mounted in the said neck, the said plunger having a product inlet at its lower end and an outlet spout at its upper end, the said plunger having teeth on its outer surface, piston means slidably mounted on the said plunger, the said piston means including lip means for engaging the said container to permit downward movement of the said piston means upon depression of the said plunger while inhibiting upward movement of the said piston means upon upward movement of the

said plunger, the said piston means increasing pressure on the said product above the said preset pressure upon downward movement of said plunger, and valve means in said plunger arranged to open, in use, at said increasing pressure to permit outward flow of the product and arranged to close when the said preset pressure is reached.

3. A dispenser as claimed in Claim 1 or Claim 2, including spring means for continuously urging the said plunger to a raised position.

4. A dispenser as claimed in Claim 3 in which the said spring means is a tension spring.

5. A dispenser as claimed in Claim 3 or Claim 4 including stop means for limiting the uppermost position of the said plunger.

6. A dispenser as claimed in any one of Claims 1 to 5 in which the said piston means includes a semi-flexible plate.

7. A dispenser as claimed in any one of Claims 1 to 5 in which the piston means includes a semi-flexible plate and lip means integral with the said semi-flexible plate, the lip means bearing against the inside surface of the container.

8. A dispenser as claimed in any one of Claims 3 to 7 in which the said spring means is a tension spring.

9. A dispenser as claimed in any one of Claims 1 to 8 in which the upper end of the said plunger means is contoured to form a finger grip.

10. A dispenser as claimed in any one of Claims 1 to 9 in which the inner wall of the said container is serrated to stabilize the piston means.

11. A dispenser as claimed in any one of Claims 1 to 10 including spring means, the said valve means permitting product flow with the said plunger in the raised position until the said preset pressure is reached.

12. A dispenser as claimed in any one of Claims 2 to 11 in which the piston means comprise flexible means conformed to the teeth on the plunger in the rest condition in such a way that the plunger can slide up back through the piston means but so that the teeth will engage the piston means and carry them with the plunger on a downward stroke.

13. A dispenser as claimed in Claim 10 and Claim 12 in which the pitch of the serrations on the inside face of the container wall is substantially the same as that of the teeth of the plunger.

14. A dispenser as claimed in Claim 1 substantially as claimed herein with reference to Figs. 1 and 2 or Figs. 1 and 3 of the accompanying drawings.

15. A dispenser as claimed in any one of Claims 1 to 14 containing a pressurized product under a preset pressure the valve means being arranged to open only on said preset pressure being exceeded and to close when

the pressure has again reduced to the preset pressure.

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Printed for Her Majesty's Stationery Office  
by Burgess & Son (Abingdon) Ltd.—1983.  
Published at The Patent Office, 25 Southampton Buildings,  
London, WC2A 1AY, from which copies may be obtained.

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